# METHOD FOR DETERMINING POSITION OF OPTIC PICK-UP HEAD AND DEVICE OF THE SAME

## 1. FIELD OF THE INVENTION

[0001] The present invention relates to a method for determining the position of an optic pick-up head and the device of the same, wherein a disk is corresponding to a plurality of frames for determining the position of the optic pick-up head relative to a compact disk.

## 2. BACKGROUND OF THE INVENTION

[0002] Since the progresses in the electric and electronic technologies, more and more products are developed for improving the human life and are used widely.

[0003] The developments of computers and calculators have induced a large variation to the human life. Not only many works can be performed rapidly, but also the data storage, input, output and others can be executed through a computer so that the working time is reduced greatly. Further, in the multi-media, by the playing through an optic disk drive, a preferred audio and video effects are present to the audiences.

[0004] In the electronic technology, audio and video signals are digitally stored in a compact disk for many years. However, in the processing technology, there are many defects necessary to be improved. There are many different compact disks having different storing formats. In the current popular digital versatile disk (DVD), many data storage formats are used, including a single layer single surface format, a single layer double surface format, a double layer single surface format, a double layer double surfaces format, etc. In the data storage, large amount of data and signals can be stored through digitally signal processing.

[0005] Referring to Fig. 1, a data section 2 in a general compact disk 1 is disclosed. In Fig. 1, a minor data storing section 200 is made on the data section 2 of the compact disk 1. This data storing section 200 is stored with data of various formats.

[0006] There are various modes in the compact disks for storing data. In the reading of data, in order to increase the reading speed, the rotary speed of the compact disk is increased mechanically. However, this mechanic way for speeding the reading of data is limited. For the current designed compact disks, since a high rotation speed will induce a large sound due to interaction with air, and moreover, the stability of the reading data is deteriorated so that faults occur in reading data. Therefore, to increase the rotary speed of an optic disk drive for speeding the reading of a data cannot solve all rotated.

[0007] Besides, in the prior art, the compact disk is rotated with a constant angular velocity (CAV). While as the data of a compact disk is read, the optic pick-up head is moved with constant linear velocity (CLV) for reading data on outer tracks of a compact disk. Further data on inner tracks is also read in CAV mode. But in reading data on inner tracks, since the frequency of a phase lock loop (PLL) is limited, when the optic pick-up head moves from outer track into inner track, the frequency is increased. If the CAV mode is converted into a CLV mode in an improper timing, it is possible that the phase lock loop cannot be operated normally. Therefore, in determining the switching timing of the CAV and CLV, the position of the optic pick-up head must be decided precisely for preventing fault.

## SUMMARY OF THE INVENTION

[0008] Accordingly, the primary object of the present invention is to provide a method for determining the position of an optic pick-up head and the device of the same, wherein a rapid and correct position determining is provided.

[0009] Another object of the present invention is to provide a method for determining the position of an optic pick-up head and the device of the same, to rapidly determine the position of an optic pick-up head.

[0010] To achieve the object, the present invention provides a method for determining the position of an optic pick-up head and the device of the same. The number of data stored in each track of the compact disk is used to determine the position of the optic pick-up head. In general, the press of a compact disk is executed with a constant linear speed. Therefore, the

number of frame in inner track of the compact disk is smaller than that in outer track, while the number of the data is positive proportional to the distance to a center of the optic pick-up head. Thereby, each compact disk is virtually divided into a plurality of sections, and number of frames per section is defined. As a result, when the optic pick-up head is at a certain section, the position of the optic pick-up head can be determined from the number of frame in the section.

[0011] The method for determining position of an optic pick-up head (CPLH) relative to a disk with a plurality of sections, each section corresponding to an upper limit and a lower limit, comprising the steps of: (1) reading sync signals on the disk; (2) generating an averaged sync signals in certain rotations of the disk; (3) comparing the averaged sync signal with the upper limit and the lower limit to determine a current section where the pick-up head is located; (4) generating a PUH ready signal indicating the PUH in a steady state, based on a frequency variation signal, a track on success signal and the rotation frequency of the disk. The step of (2) generating the averaged sync signals includes: (a) determining a rotation frequency of the disk based on the moving speed of the PUH and the distance between the PUH and a center of disk; and (b) calculating sync signals in certain rotation of the disk. Further, by the virtual division of the frame of a compact disk provided in the present invention and the division of the frame, the data can be read rapidly and the position of the optic pick-up head can be searched rapidly.

[0012] In the device for an optic pick-up head to search for a position of the present invention, the device comprises: a position detector for receiving and processing a signal of a frequency variation (FA), a track on success signal (TOS), and a frequency of disk rotation signal (FODR) and outputting a pick-up head ready signal (PUHRDY); and a position condition detecting unit for receiving a frame synchronous signal (FRAMESYNC) and a disk rotating frequency signal (FODR), and outputting an optic pick-up head position signal; wherein the effectiveness of the optic pick-up head position refers to a condition of the pick-up head ready signal.

[0013] Preferably, the position condition detecting unit further comprises: a counting unit for receiving the FRAMESYNC signal and the FODR signal and outputting a FRAMESYNC per FODR; a position counting unit,